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## A MILLISECOND CONVERSION TABLE

BY  
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A MILLISECOND CONVERSION TABLE

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## A MILLISECOND CONVERSION TABLE

### INTRODUCTION

Time and data correlation are a necessary step in satellite data analysis. As a satellite proceeds in its orbits around the earth, or in flight to other celestial bodies, continuous and accurate time checks must be assured. When satellite data is recorded on magnetic tapes, time codes representing standard time configurations specified by NASA are also recorded. The code fixes the time data is received from the satellite relative to calendar days and mean Greenwich time to establish a time base for data calculations.

### TIME CONVERSION

Scientific personnel are frequently involved with desk calculations that are insignificant in mathematical rigor but are none-the-less time consuming to perform. One such type of calculation is the conversion of time in increments of days of the year, hours of the day, minutes of hours and seconds of minutes to millisecond totals. The amount of work involved to convert time from seconds through days of the year to a millisecond count consists of four multiplications of the number of milliseconds in each time unit designated plus four steps of addition to obtain the sum of the results of the multiplications. If several time conversions are desired, a great deal of arithmetic manipulations are required.

Use of a conversion table will simplify the operations and save time spent in the multiplication steps. A tabular compilation of milliseconds for each time increment from units of seconds to days of the year reduces the process to quick observations and additions of specified millisecond quantities.

### MILLISECOND CONVERSION TABLE

The millisecond conversion table was generated to aid individuals performing data analysis involving time presented in units of the Gregorian Calendar and mean Greenwich time that has to be converted to milliseconds or from milliseconds to some time representation of the calendar and daily time base. Its major applications are for the determination of time periods to establish data transitions and for time differential checks to verify synchronized and continuous data patterns. It can also be used for any computations where millisecond conversions are necessary.

## TABLE FORMAT

This table is a progressive millisecond tabulation from one second through one year. It is separated into four stages consisting of:

1. Milliseconds per second from one to sixty seconds
2. Milliseconds per minute from one to sixty minutes
3. Milliseconds per hour from one to twenty four hours
4. Milliseconds per day from one to three hundred and sixty five days

No millisecond count has been included, since it is a one to one conversion for each count and millisecond totals can readily be added to the other summations.

The table has been prepared in columns with the time to be converted to the left of the milliseconds corresponding to it. Each column has a heading for the range of time items to be converted. Included in the upper right hand corner of the tables is the number of milliseconds for the time unit listed. These values can be used for rapid reference when tabulation checks are desired.

The totals per time unit are:

1. 1,000 milliseconds per second
2. 60,000 milliseconds per minute
3. 3,600,000 milliseconds per hour
4. 86,400,000 milliseconds per 24 hours

The table is arranged so that a value can be easily arrived at by four tabular references and four additions to obtain a millisecond resolution for all units of time from days of the year down to units of seconds. One more addition is necessary for a milliseconds resolution which includes an accumulated time with milliseconds as the smallest increment of time.

# MILLISECOND TO SECOND CONVERSION TABLE

1,000MS/Sec

1 to 20 Seconds		21 to 40 Seconds		41 to 60 Seconds	
Seconds	Milliseconds	Seconds	Milliseconds	Seconds	Milliseconds
1	1,000	21	21,000	41	41,000
2	2,000	22	22,000	42	42,000
3	3,000	23	23,000	43	43,000
4	4,000	24	24,000	44	44,000
5	5,000	25	25,000	45	45,000
6	6,000	26	26,000	46	46,000
7	7,000	27	27,000	47	47,000
8	8,000	28	28,000	48	48,000
9	9,000	29	29,000	49	49,000
10	10,000	30	30,000	50	50,000
11	11,000	31	31,000	51	51,000
12	12,000	32	32,000	52	52,000
13	13,000	33	33,000	53	53,000
14	14,000	34	34,000	54	54,000
15	15,000	35	35,000	55	55,000
16	16,000	36	36,000	56	56,000
17	17,000	37	37,000	57	57,000
18	18,000	38	38,000	58	58,000
19	19,000	39	39,000	59	59,000
20	20,000	40	40,000	60	60,000

# MILLISECONDS TO MINUTES CONVERSION TABLE

60,000MS/Min

1 to 20 Minutes		21 to 40 Minutes		41 to 60 Minutes	
Minutes	Milliseconds	Minutes	Milliseconds	Minutes	Milliseconds
1	60,000	21	1,260,000	41	2,460,000
2	120,000	22	1,320,000	42	2,520,000
3	180,000	23	1,380,000	43	2,580,000
4	240,000	24	1,440,000	44	2,640,000
5	300,000	25	1,500,000	45	2,700,000
6	360,000	26	1,560,000	46	2,760,000
7	420,000	27	1,620,000	47	2,820,000
8	480,000	28	1,680,000	48	2,880,000
9	540,000	29	1,740,000	49	2,940,000
10	600,000	30	1,800,000	50	3,000,000
11	660,000	31	1,860,000	51	3,060,000
12	720,000	32	1,920,000	52	3,120,000
13	780,000	33	1,980,000	53	3,180,000
14	840,000	34	2,040,000	54	3,240,000
15	900,000	35	2,100,000	55	3,300,000
16	960,000	36	2,160,000	56	3,360,000
17	1,020,000	37	2,220,000	57	3,420,000
18	1,080,000	38	2,280,000	58	3,480,000
19	1,140,000	39	2,340,000	59	3,540,000
20	1,200,000	40	2,400,000	60	3,600,000

# MILLISECONDS TO HOURS CONVERSION TABLE

3,600,000MS/hr

1 to 24 Hours	
Hours	Milliseconds
1	3,600,000
2	7,200,000
3	10,800,000
4	14,400,000
5	18,000,000
6	21,600,000
7	25,200,000
8	28,800,000
9	32,400,000
10	36,000,000
11	39,600,000
12	43,200,000
13	46,800,000
14	50,400,000
15	54,000,000
16	57,600,000
17	61,200,000
18	64,800,000
19	68,400,000
20	72,000,000
21	75,600,000
22	79,200,000
23	82,800,000
24	86,400,000

# MILLISECONDS TO DAYS CONVERSION TABLE

86,400,000MS/day

1 to 20 Days		21 to 40 Days		41 to 60 Days	
Days	Milliseconds	Days	Milliseconds	Days	Milliseconds
1	86,400,000	21	1,814,400,000	41	3,542,400,000
2	172,800,000	22	1,900,800,000	42	3,628,800,000
3	259,200,000	23	1,987,200,000	43	3,715,200,000
4	345,600,000	24	2,073,600,000	44	3,801,600,000
5	432,000,000	25	2,160,000,000	45	3,888,000,000
6	518,400,000	26	2,246,400,000	46	3,974,400,000
7	604,800,000	27	2,332,800,000	47	4,060,800,000
8	691,200,000	28	2,419,200,000	48	4,147,200,000
9	777,600,000	29	2,505,600,000	49	4,233,600,000
10	864,000,000	30	2,592,000,000	50	4,320,000,000
11	950,400,000	31	2,678,400,000	51	4,406,400,000
12	1,036,800,000	32	2,764,800,000	52	4,492,800,000
13	1,123,200,000	33	2,851,200,000	53	4,579,200,000
14	1,209,600,000	34	2,937,600,000	54	4,665,600,000
15	1,296,000,000	35	3,024,000,000	55	4,752,000,000
16	1,382,400,000	36	3,110,400,000	56	4,838,400,000
17	1,468,800,000	37	3,196,800,000	57	4,924,800,000
18	1,555,200,000	38	3,283,200,000	58	5,011,200,000
19	1,641,600,000	39	3,369,600,000	59	5,097,600,000
20	1,728,000,000	40	3,456,000,000	60	5,184,000,000



**MILLISECONDS TO DAYS CONVERSION TABLE**  
(Continued)

86,400,000MS/day

61 to 80 Days		81 to 100 Days		101 to 120 Days	
Days	Milliseconds	Days	Milliseconds	Days	Milliseconds
61	5,270,400,000	81	6,998,400,000	101	8,726,400,000
62	5,356,800,000	82	7,084,800,000	102	8,812,800,000
63	5,443,200,000	83	7,171,200,000	103	8,899,200,000
64	5,529,600,000	84	7,257,600,000	104	8,985,600,000
65	5,616,000,000	85	7,344,000,000	105	9,072,000,000
66	5,702,400,000	86	7,430,400,000	106	9,158,400,000
67	5,788,800,000	87	7,516,800,000	107	9,244,800,000
68	5,875,200,000	88	7,603,200,000	108	9,331,200,000
69	5,961,600,000	89	7,689,600,000	109	9,417,600,000
70	6,048,000,000	90	7,776,000,000	110	9,504,000,000
71	6,134,400,000	91	7,862,400,000	111	9,590,400,000
72	6,220,800,000	92	7,948,800,000	112	9,676,800,000
73	6,307,200,000	93	8,035,200,000	113	9,763,200,000
74	6,393,600,000	94	8,121,600,000	114	9,849,600,000
75	6,480,000,000	95	8,208,000,000	115	9,936,000,000
76	6,566,400,000	96	8,294,400,000	116	10,022,400,000
77	6,652,800,000	97	8,380,800,000	117	10,108,800,000
78	6,739,200,000	98	8,467,200,000	118	10,195,200,000
79	6,825,600,000	99	8,553,600,000	119	10,281,600,000
80	6,912,000,000	100	8,640,000,000	120	10,368,000,000

MILLISECONDS TO DAYS CONVERSION TABLE  
(Continued)

86,400,000MS/day

121 to 140 Days		141 to 160 Days		161 to 180 Days	
Days	Milliseconds	Days	Milliseconds	Days	Milliseconds
121	10,454,400,000	141	12,182,400,000	161	13,910,400,000
122	10,540,800,000	142	12,268,800,000	162	13,996,800,000
123	10,627,200,000	143	12,355,200,000	163	14,083,200,000
124	10,713,600,000	144	12,441,600,000	164	14,169,600,000
125	10,800,000,000	145	12,528,000,000	165	14,256,000,000
126	10,886,400,000	146	12,614,400,000	166	14,342,400,000
127	10,972,800,000	147	12,700,800,000	167	14,428,800,000
128	11,059,200,000	148	12,787,200,000	168	14,515,200,000
129	11,145,600,000	149	12,873,600,000	169	14,601,600,000
130	11,232,000,000	150	12,960,000,000	170	14,688,000,000
131	11,318,400,000	151	13,046,400,000	171	14,774,400,000
132	11,404,800,000	152	13,132,800,000	172	14,860,800,000
133	11,491,200,000	153	13,219,200,000	173	14,947,200,000
134	11,577,600,000	154	13,305,600,000	174	15,033,600,000
135	11,664,000,000	155	13,392,000,000	175	15,120,000,000
136	11,750,400,000	156	13,478,400,000	176	15,206,400,000
137	11,836,800,000	157	13,564,800,000	177	15,292,800,000
138	11,923,200,000	158	13,651,200,000	178	15,379,200,000
139	12,009,600,000	159	13,737,600,000	179	15,465,600,000
140	12,096,000,000	160	13,824,000,000	180	15,552,000,000

MILLISECONDS TO DAYS CONVERSION TABLE  
(Continued)

86,400,000MS/day

181 to 200 Days		201 to 220 Days		221 to 240 Days	
Days	Milliseconds	Days	Milliseconds	Days	Milliseconds
181	15,638,400,000	201	17,366,400,000	221	19,094,400,000
182	15,724,800,000	202	17,452,800,000	222	19,180,800,000
183	15,811,200,000	203	17,539,200,000	223	19,267,200,000
184	15,897,600,000	204	17,625,600,000	224	19,353,600,000
185	15,984,000,000	205	17,712,000,000	225	19,440,000,000
186	16,070,400,000	206	17,798,400,000	226	19,526,400,000
187	16,156,800,000	207	17,884,800,000	227	19,612,800,000
188	16,243,200,000	208	17,971,200,000	228	19,699,200,000
189	16,329,600,000	209	18,057,600,000	229	19,785,600,000
190	16,416,000,000	210	18,144,000,000	230	19,872,000,000
191	16,502,400,000	211	18,230,400,000	231	19,958,400,000
192	16,588,800,000	212	18,316,800,000	232	20,044,800,000
193	16,675,200,000	213	18,403,200,000	233	20,131,200,000
194	16,761,600,000	214	18,489,600,000	234	20,217,600,000
195	16,848,000,000	215	18,576,000,000	235	20,304,000,000
196	16,934,400,000	216	18,662,400,000	236	20,390,400,000
197	17,020,800,000	217	18,748,800,000	237	20,476,800,000
198	17,107,200,000	218	18,835,200,000	238	20,563,200,000
199	17,193,600,000	219	18,921,600,000	239	20,649,600,000
200	17,280,000,000	220	19,008,000,000	240	20,736,000,000

MILLISECONDS TO DAYS CONVERSION TABLE  
(Continued)

86,400,000MS/day

241 to 260 Days		261 to 280 Days		281 to 300 Days	
Days	Milliseconds	Days	Milliseconds	Days	Milliseconds
241	20,822,400,000	261	22,550,400,000	281	24,278,400,000
242	20,908,800,000	262	22,636,800,000	282	24,364,800,000
243	20,995,200,000	263	22,723,200,000	283	24,451,200,000
244	21,081,600,000	264	22,809,600,000	284	24,537,600,000
245	21,168,000,000	265	22,896,000,000	285	24,624,000,000
246	21,254,400,000	266	22,982,400,000	286	24,710,400,000
247	21,340,800,000	267	23,068,800,000	287	24,796,800,000
248	21,427,200,000	268	23,155,200,000	288	24,883,200,000
249	21,513,600,000	269	23,241,600,000	289	24,969,600,000
250	21,600,000,000	270	23,328,000,000	290	25,056,000,000
251	21,686,400,000	271	23,414,400,000	291	25,142,400,000
252	21,772,800,000	272	23,500,800,000	292	25,228,800,000
253	21,859,200,000	273	23,587,200,000	293	25,315,200,000
254	21,945,600,000	274	23,673,600,000	294	25,401,600,000
255	21,032,000,000	275	23,760,000,000	295	25,488,000,000
256	22,118,400,000	276	23,846,400,000	296	25,574,400,000
257	22,204,800,000	277	23,932,800,000	297	25,660,800,000
258	22,291,200,000	278	24,019,200,000	298	25,747,200,000
259	22,377,600,000	279	24,105,600,000	299	25,833,600,000
260	22,464,000,000	280	24,192,000,000	300	25,920,000,000

**MILLISECONDS TO DAYS CONVERSION TABLE**  
(Continued)

86,400,000MS/day

301 to 322 Days		323 to 344 Days		345 to 365 Days	
Days	Milliseconds	Days	Milliseconds	Days	Milliseconds
301	26,006,400,000	323	27,907,200,000	345	29,808,000,000
302	26,092,800,000	324	27,993,600,000	346	29,894,400,000
303	26,179,200,000	325	28,080,000,000	347	29,980,800,000
304	26,265,600,000	326	28,166,400,000	348	30,067,200,000
305	26,352,000,000	327	28,252,800,000	349	30,153,600,000
306	26,438,400,000	328	28,339,200,000	350	30,240,000,000
307	26,524,800,000	329	28,425,600,000	351	30,326,400,000
308	26,611,200,000	330	28,512,000,000	352	30,412,800,000
309	26,697,600,000	331	28,598,400,000	353	30,499,200,000
310	26,784,000,000	332	28,684,800,000	354	30,585,600,000
311	26,870,400,000	333	28,771,200,000	355	30,672,000,000
312	26,956,800,000	334	28,857,600,000	356	30,758,400,000
313	27,043,200,000	335	28,944,000,000	357	30,844,800,000
314	27,129,600,000	336	29,030,400,000	358	30,931,200,000
315	27,216,000,000	337	29,116,800,000	359	31,017,600,000
316	27,302,400,000	338	29,203,200,000	360	31,104,000,000
317	27,388,800,000	339	29,289,600,000	361	31,190,400,000
318	27,475,200,000	340	29,376,000,000	362	31,276,800,000
319	27,561,600,000	341	29,462,400,000	363	31,363,200,000
320	27,648,000,000	342	29,548,800,000	364	31,449,600,000
321	27,734,400,000	343	29,635,200,000	365	31,536,000,000
322	27,820,800,000	344	29,721,600,000		